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Harris A. Wolin**RECEIVED  
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Attorney Docket No.: 3094/FLK (032878-87728)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor : Minoru Nakano et al.  
Serial No. : 09/675,220  
Filed : September 29, 2000  
Title : **Method and Apparatus for Controlling ...**  
Examiner : Caridad M. Everhart  
Group Art Unit : 2825  
Confirmation No. : 1221

**OFFICIAL**

February 3, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**RESPONSE TO OFFICE ACTION**

Sir:

Applicant hereby petitions for a two-month extension, a petition pursuant to 37 C.F.R. §1.136(a) and authorization to charge the requisite fee being enclosed.

A non-final Office Action was mailed September 4, 2003. In response to such Office Action, Applicant's representative conducted a telephone interview with the Examiner on January 22, 2004, for which the Applicant is very appreciative. The Interview Summary generated from such interview stated that *"In a letter faxed on 1-22-2004, applicant's representative presented arguments which the examiner agreed overcame the prior art of record, and at the time of a formal response, an updated search will be done. Applicant's representative*

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*indicated a formal response to the last Office Action will be made."* The following constitutes a formal response to the Office Action of September 4, 2003, the content of which is substantially identical to the letter faxed to the Examiner on January 22, 2004.

Applicant respectfully submits that the Examiner did not fully understand the present invention in the light of the following points.

Firstly, in the Interview Summary of April 22, 2003, the Examiner asserts that "col. 7, lines 11-24 and 33-37 of Anderson (US 5,790,750) discloses two temperatures which are determined by Anderson." and on page 4 of paper No. 6, the Examiner also asserts that "Anderson discloses the detecting and heating of central portions and peripheral portions of the wafer independently." However, Anderson simply mentions four temperature control zones to effectively control the temperatures on the surfaces of the substrate and susceptor (col. 7, lines 11-24) and does not refer to the two temperatures at all.

Secondly, in the First Office Action dated September 4, 2003, the Examiner asserts that "the preset values of the power ratios are used to set the heating lamps (col. 36, lines 40-50)" in Moore (US 6,310,327 B1). However, Moore discloses "The power to all lamps 505 is either increased or decreased as one; however, the ratio of power between lamps is fixed, so that an increase in power to lamps 505 results in different amounts of increase to individual groups of lamps according to the pre-determined power ratios for the lamp groups." (col. 37, lines 6-11). Therefore, it is clear that Moore does not change power ratios based on selected temperatures, which is different from the present invention defined in claim 1. In contrast, the present invention specifies that a set of power ratios for two or more selected temperatures are predetermined and that the power ratios for a given temperature are determined based on predetermined power ratios for selected temperatures as set forth in claim 1.

Furthermore in the same Office Action of September 4, 2003, the Examiner asserts that "In calibration, sensing is accomplished in the calibration runs using more sensors than in a processing run (col. 4, lines 45-53; col. 5, lines 2-45; col. 6, lines 12-15; col. 7, lines 3-8, 45-53)", and also assert that "During a processing run the quartz window reading is used (col. 1, lines 54-67; col. 2, lines 1-8)". In this regard, Najm (US 5,305,417) discloses that for the wafer pyrometer calibration process 100, "as shown in block 106, the wafer pyrometer 32 and window

pyrometer 50 operate to obtain wafer pyrometer temperature reading  $V_{Pn}$ , where  $n=1, 2, 3$  and  $4$ , and window pyrometer readings  $V_w$ ," (col. 4, lines 59-62) and "During heating process execution, as shown in block 144, wafer pyrometer readings  $V_{Pn}$  and window pyrometer reading  $V_w$  are collected." (col. 7, lines 14-16). From this point, Applicants respectfully submit that in Najm, sensing for processing run is accomplished by not only the quartz window reading but also the wafer reading. Therefore, it is clear that Najm uses the same number of sensors for the calibration run and for the processing run, which is different from the present invention defined in claim 1. In contrast, the present invention specifies that the number of temperature sensors used in the determining step is greater than the number of temperature sensors used in the controlling step.

The present invention is motivated from the point that the power ratios are preferably changed according to the temperatures of the reaction chamber during a process, and therefore a plurality of power ratios corresponding to the temperatures are previously determined in the present invention. And further, the present invention also has its inventive features on that temperature uniformity can be accomplished without measuring temperatures at various regions of the wafer during a process. Accordingly, fewer sensors can be used for the actual processing than the power ratios determining step. Applicants believe that these points of the present invention are not taught or implied in the cited references.

To summarize, Applicants believe the differences between the present invention and the cited references lie on that:

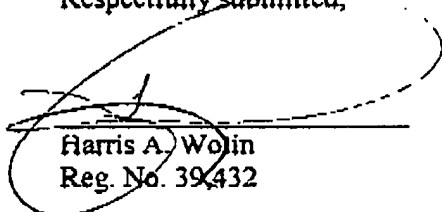
- 1) Moore does not disclose that power ratios corresponding to a plurality of temperatures are determined and power ratios are changed according to varying temperatures.
- 2) Najm does not disclose that more sensors are used for determining power ratios and fewer sensors are used for controlling temperatures.

Reconsideration is respectfully requested.

In view of the above remarks, it is believed that claims 1-11, 15-17 and 22-27, consisting of independent claims 1 and 23 and the claims dependent therefrom, are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, she is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fees due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted;



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